



BID PACKAGE

PART IV

SPECIFICATIONS

DMH Project# 2019-016

**Replacement of Third Floor Rubber Roof
Quincy Mental Health Center
460 Quincy Avenue
Quincy, Massachusetts 02169**

**THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF HUMAN SERVICES
DEPARTMENT OF MENTAL HEALTH**

S P E C I F I C A T I O N S

FOR

**THIRD FLOOR ROOF REPLACEMENT
QUINCY MENTAL HEALTH CENTER**

AT

**460 QUINCY AVENUE
QUINCY, MASSACHUSETTS**

PROJECT 2019-016

**DEPARTMENT OF MENTAL HEALTH
OFFICE OF ENGINEERING AND FACILITIES MANAGEMENT
167 LYMAN STREET
WESTBOROUGH, MA 01581**

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DATE: OCTOBER 22, 2018

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SECTION 011000
SUMMARY OF THE WORK

PART 1 – GENERAL

1.1 CONTRACT REFERENCES

- A. Attention is directed to the CONTRACT and GENERAL CONDITIONS and all Sections within Division 1 – GENERAL REQUIREMENTS that are hereby made a part of this Section of the Specifications.

1.2 DEFINITIONS

- A. The following terms shall be applicable to these Specifications:
1. **DMH Project Manager:** Refers to Fred Bergstrom, Massachusetts Department of Mental Health, Engineering and Facilities Management, 167 Lyman Street, Westborough, MA 02169-1043. (508) 616-2245.
 2. **DMH Site Director:** Refers to Mona McKinnon, Massachusetts Department of Mental Health, 460 Quincy Avenue, Quincy, MA 02169-8130. (617) 984-1016.
 3. **DMH Facility Manager:** Refers to Brad Graham, Massachusetts Department of Mental Health, 460 Quincy Avenue, Quincy, MA 01854. (617) 984-1043.
 4. **Contractor:** Refers to the Contractor who has been awarded the overall contract for the work outlined by the Contract Documents.
 5. **Subcontractor:** Refers to any contractor who is working under the direct supervision of the Contractor including but not limited to: electrician, carpenter, painter, and trucking/transport companies.
 6. **Site:** Refers to Quincy Mental Health Center, 460 Quincy Avenue, Quincy, MA 02169-8130.
- B. The terms are provided to facilitate communication but do not supersede the legal definitions provided in the Contract.

1.3 WORK UNDER THIS CONTRACT

- A. The work described under this Contract is to provide all labor, material, tools, equipment, and supervision necessary to remove approximate 8,000 square foot roofing system and to complete the installation of an EPDM membrane Fully Adhered roofing system including flashings and insulation as specified herein and as indicated on the Drawings in accordance with the manufacturer's most current specification's and details.

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- B. Scope of Work - The general scope of work under the bid includes but is not limited to the following:
1. Application of, paying for, and securing any and all permits required from local, state and federal agencies, and other authorities having jurisdiction over construction on the Site, including submitting, revising, and resubmitting all required plans, permits, and notifications.
 2. Preparation and submission of project work plan and construction schedule. The Plan shall include all requirements necessary to keep all facilities open at all times for safe public access and use.
 3. Mobilization to the Site including but not limited to establishment of the Contractor's Work Space on the Site.
 4. Establish work area perimeter and dust control measures.
 5. Perform required selective demolition, including but not limited to, removal and disposal of existing membrane roof, insulation, parapet coping, and miscellaneous materials used in the existing roof installation.
 6. Install a total of 6-inches rigid foam board insulation across the entire roof, fastened to the steel decking including sloping of roofing to the existing roof drains.
 7. Install rough carpentry as necessary to complete the insulation installation.
 8. Installation of an adhered black 60-mil EPDM, the flashing of all roof top equipment, and any additional work to complete the installation.
 9. Installation of metal flashing at the locations currently flashed including the parapet coping and any additional work to complete the installation.
 10. Inspection of existing roof drains during the installation process to ensure that they are in proper working order and notify the DMH Project Manager if they need any repair or replacement work.

1.4 CONTRACT INTENT

- A. The intent of these specifications is to cover removal and replacement work, complete and operable in every respect with the specified warranties for both materials and installation. It is not intended to give every detail in specifications or on the Drawings. DMH is not responsible for absence of information pertaining to the roof's overall condition, especially below the existing membrane roof of any detail Contractor may require. Furnish all material and equipment usually furnished with such a roofing system and/or needed to make a complete watertight and weathertight installation, whether specifically mentioned or not, omitting only such parts as are specific exceptions from the Specifications.

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- B. The entire roofing installation will be a non-proprietary design and include an acceptable weathertight system as specified in Section 075323 and elsewhere.

1.5 EXISTING CONDITIONS

- A. The project site is a four-story structure with a partially raised basement. The building was constructed in 1980 and the existing roof was installed in approximately the year 1989.
- B. The existing roof has 2-1/2 inch rigid foam insulation and is underlain by a steel deck.

1.6 EXAMINATION OF SITE AND DOCUMENTS

- A. A mandatory pre-bid conference will be held at the job site on the date and at the time indicated in the Invitation to Bid.
- B. Bidders are expected to examine and to be thoroughly familiar with all contract documents and with the conditions under which the work is to be carried out. The Commonwealth will not be responsible for errors, omissions, and/or charges for extra work arising from the Contractors or Subcontractors failure to familiarize themselves with the contract documents, that he is familiar with the conditions and requirements of both where they require, in any part of the work a given result to be produced, that the contract documents are adequate and he will produce the required results.

1.7 CONTRACTOR QUALIFICATIONS

- A. The roofing system must be installed by an applicator authorized and trained by the manufacturer in compliance with shop drawings as approved by the manufacturer.
- B. The Contractor shall be a Division of Capital Asset Management and Maintenance (DCAMM) certified roofing contractor with a current certification.
- C. Within three business days from the bid opening, the apparent low bidder shall submit a certification in writing that it has successfully performed at least three recent (within last five years) projects of similar size, scope, and cost. The apparent low bidder shall submit the following information for each project:
 - 1. Project Description
 - 2. Project Value

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3. Date was conducted
 4. Reference with contact information for the Owner who was the recipient of the work.
- C. The Contractor shall submit the name and resume of the proposed superintendent within three business days of the bid opening to DMH Project Manager for approval.
- D. Letter of Certification
1. Within three days of the bid opening, the Contractor shall submit a letter of certification from the manufacturer which certifies that the Contractor is authorized to install the manufacturer's roofing system and list foreman who have received training from the manufacturer along with the dates training was received.
- E. The Contractor's Updated Statement is not a public record as defined in M.G.L., Chapter 4, Section 7, and will not be open to public inspection.

1.8 CONTRACT METHOD

- A. Work under this Contract shall be lump sum price, for the scopes of work as described in these Specifications.
- B. Should additional work be required or should the quantities of certain classes of work be increased or decreased from those required by the Contract Documents, by authorization of DMH, the unit prices provided by the Bidder as part of his/her bid shall at the option of DMH, be the basis of payment to the Contractor or credit to DMH, for such increase or decrease in the work. Additional information on Unit Prices is presented in Section 012200 and procedures for processing such increases or decreases are specified in the Contract.
- C. The Massachusetts Standard Labor Wage rates, as included in the Contract exhibits, will be used for base contract work, as well as any change order work.

1.9 SUPERVISION OF THE WORK

- A. The Contractor shall be held directly responsible for the correct installation of all work performed under this Contract. The Contractor must make good repair, without expense to the Commonwealth, of any part of the new work, or existing work to remain, which may become inoperative on account of leaving the work unprotected or unsupervised during construction of the system or which may break or give out in any manner by reason of poor workmanship, defective materials or any lack of

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space to allow for expansion and contraction of the work during the Contractor's warranty period, from the date of final acceptance of the work by DMH.

- B. The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with his direct work.
- C. The Contractor shall provide adequate number of experienced workers regularly engaged in this type of work who are skilled in the application of the materials specified.
- D. The Contractor shall provide at least one thoroughly trained and experienced superintendent on the job at all times work is in progress.

1.10 CONTRACTOR'S USE OF THE PREMISES

- A. The Contractor can gain access to the premises during the hours specified below. In addition the Contractor and his personnel will limit themselves to only within the Site during working hours. If work needs to be scheduled during times other than those listed below, the Contractor shall inform the DMH Project Manager one week prior to work.
 - 1. Deliveries: 7:00 am to 8:30 am and after 1:00 pm.
 - 2. General Access: 7:00 am to 4:00 pm.
- B. Confine operations at the site to areas permitted by DMH requirements.
- C. All on-site workers will be required to wear identifying name badges.
- D. The Contractor shall supervise the use of the Site related to construction and be responsible for correcting any damage identified by DMH to DMH's satisfaction.
 - 1. An existing conditions survey shall be conducted prior to any work being performed with the DMH Project Manager and the DMH Site Director or their representatives.
- E. All available existing utilities adjacent to the construction site will be available for use during construction unless indicated otherwise. These utilities would include water, sewer, and electricity (110 volt) Temporary connections to these utilities, all metering, transformers, removal, usage, and their associated costs will be the responsibility of the Contractor.
- F. All apparatus, storage, and the operation of workmen in connection with activities under this Section shall be confined to limits of the Contract.

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Storage will not be permitted on the property without the approval of the DMH Project Manager.

- G. All parking regulations shall be observed.

1.11 COORDINATION

- A. The Contractor shall be responsible for the proper fitting of all the work and for the coordination of the operations of all trades, subcontractors or material and men engaged upon the work. The Contractor shall do, or cause his agents to do, all cutting, fitting, adjusting, and repair necessary in order to make the several parts of the work come together properly.
- B. Execute the work in an orderly and careful manner with due regard to the occupants of the facility, the public, the employees, and the normal function of the facility.
- C. The work sequence shall follow planning and schedule established by the Contractor as approved by the DMH Project Manager. The work upon the Site shall commence promptly and be executed with full simultaneous progress. Work operations which require the interruption of utilities, service, and access shall be scheduled so as to involve minimum disruption and inconvenience, and to be expedited so as to insure minimum duration of any periods of disruption or inconvenience.
- D. The Contractor shall review the tolerances established in the specifications for each type of work and as established by trade organizations. The Contractor shall coordinate the various trades and resolve any conflicts that may exist between trade tolerances without additional cost to DMH. The Contractor shall provide any chipping, leveling, shoring or surveys to ensure that the various materials align.

1.12 REFERENCE STANDARDS

- A. For products specified by association or trade standards, comply with requirements for the standard, except where more rigid requirements are specified or are required by codes. Refer to the specific Specification for specific references.
- B. Where reference is made in the Contractual Documents to Publications and Standards issued by Associations or Societies, the intent shall be understood to specify the current edition of such Publications or Standards (including tentative revision) in effect on the date of the contract advertisement notwithstanding any reference to a particular date.

1.13 PRECONSTRUCTION CONFERENCE

- A. The Contractor shall have a responsible representative at the pre-construction conference to be called by the DMH Project Manager following the award of the Contract, as well as representatives of field or office forces and major subcontractors. All such representatives shall have authority to act for their respective firms. The pre-construction conference is to be held within five days of Notice to Proceed, or as otherwise determined by DMH.
- B. Representatives of the following shall be required to attend this conference:
 - 1. DMH Project Manager
 - 2. DMH Site Director
 - 3. Contractor
 - 4. Roofing Installer
 - 5. Roofing system manufacturer's representative
 - 4. All Subcontractors
- C. The Agenda for the meeting shall include, but not be limited to:
 - 1. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
 - 4. Review structural loading limitations of roof deck during and after roofing.
 - 5. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
 - 6. Review governing regulations and requirements for insurance and certificates if applicable.
 - 7. Review temporary protection requirements for roofing system during and after installation.
 - 8. Review roof observation and repair procedures after roofing installation.
 - 9. Review methods and procedures related to sheet metal flashing and trim.

1.14 WORK BY DMH

- A. DMH will provide Site Access
- B. DMH will designate parking and staging areas.
- C. DMH will designate areas for the locations of cranes, hoists, and chutes for loading and unloading materials to and from the roof.
- D. Sanitary facilities are available at the Site and will be designated by the DMH Facility Manager. The Contractor is expected to maintain a clean and sanitary condition in the restrooms.
- E. Stairs and passenger elevator may be used for personnel, removing debris and delivering materials.
- F. DMH will provide access to water and electrical facilities. Note that electrical service in the Building is 110 volt. If the Contractor requires additional power, the Contractor is responsible to provide the additional power under the base contract fee.
- G. DMH shall engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.

1.15 SUBCONTRACTORS

- A. After selection, the successful Bidder shall submit a list of subcontractors proposed for the performance of the Work to DMH for approval. The list shall include the name, address, contact person, and MA tax identification number for each subcontractor.

1.16 PROJECT MEETINGS

- A. Project meetings shall be held on a weekly basis and as required subject to the discretion of the DMH Project Manager.
- B. As a prerequisite for monthly payments, ordering schedules, shop drawing schedules, and coordination meeting schedules shall be prepared and maintained by the Contractor and shall be revised and updated on a monthly basis, and a copy shall be submitted to the DMH Project Manager.
- C. In order to expedite construction progress on this project, the Contractor shall order all materials immediately after the approval of shop drawings and shall obtain a fixed date of delivery to the project site for all materials ordered which shall not impede or otherwise interfere with construction progress. The Contractor shall present a list and written proof of all

materials and equipment ordered (through purchase orders). Such list shall be presented at the meetings and shall be continuously updated.

- D. Scheduling shall be discussed with all concerned parties, and methods shall be presented by the Contractor which shall reflect construction completion not being deferred or foreshortened. Identify critical long-lead items and other special scheduling requirements. The project schedule is to include time for submission of shop drawing submittals, time for review, and allowance for resubmittal and review.
- E. Project meetings shall be chaired by the DMH Project Manager.
- F. Minutes of the project meetings shall be prepared by the DMH Project Manager and shall be distributed to all present within 72 hours of the Project Meeting.

1.17 PERMITS, INSPECTION AND TESTING REQUIRED BY GOVERNING AUTHORITIES

- A. If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having any jurisdiction require any portion of the Work to be inspected, tested, or approved, the Contractor shall give the DMH Project Manager, and such Authority timely notice of its readiness so the DMH Project Manager may observe such inspecting, testing, or approval.
- B. Prior to the start of construction, the Contractor shall complete application to the applicable Building Code enforcement authority for a Building Permit. Such Permit shall be displayed in a conspicuous location at the project site.
- C. Unless otherwise specified under the Sections of the Specifications, the Contractor shall pay such proper and legal fees to public officers and others as may be necessary for the due and faithful performance of the work and which may arise as incidental to the fulfilling of this Contract. As such, all fees, charges and assessments in connection with the above shall be paid by the Contractor.

1.18 CUTTING, CORING, AND PATCHING, UNLESS OTHERWISE INDICATED

- A. The Contractor shall do all cutting, coring, fitting and patching of his work that may be required to make its several parts come together properly and fit it to receive or be received by work of the Subcontractors as indicated in the Specifications.

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- B. The Contractor shall not endanger any work by cutting, coring, or otherwise altering the work and shall not cut or alter the work of any other Subcontractor except with the written consent of the DMH Project Manager.
- C. Submit a written request to the DMH Project Manager well in advance of executing any cutting or alteration which affects:
 - 1. Work of DMH or separate contractor.
 - 2. Structural value or integrity of any element of the Project.
 - 3. Integrity or effectiveness of weather-exposed or moisture-resistant elements or systems.
 - 4. Efficiency, operational life, maintenance, or safety of operational elements.
 - 5. Visual qualities of sight-exposed elements.
 - 6. Request shall include:
 - a. Identification of the Project.
 - b. Description of affected work.
 - c. The necessity for cutting, alteration, or excavation.
 - d. Effect on work of DMH or any separate contractor, or on structural or weatherproof integrity of Project.
 - e. Description of proposed work:
 - f. Alternatives to cutting and patching.
 - g. Cost proposal, when applicable.
 - h. Written permission of any separate contractor whose work will be affected.
 - 7. Should conditions of Work or the schedule indicate a change of products from original installation, the Contractor shall submit request for substitution to the DMH Project Manager.
 - 8. Submit written notice to the DMH Project Manager designating date and time the work will be uncovered a minimum of three business days in advance.
- D. Performance:
 - 1. Execute cutting and patching by methods which will prevent damage to other work, and will provide proper surfaces to receive installation of repairs.
 - a. In general, where mechanical cutting is required, cut work with sawing and grinding tools, not with hammering and chopping tools.
 - 2. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes.
 - 3. Restore work which has been cut or removed; install new products to provide completed Work in accordance with requirements of Contract

Documents.

4. Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
5. Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work.
6. Restore exposed finishes of patched areas; and, where necessary extend finish restoration onto retained work adjoining, in a manner which will eliminate evidence of patching.
7. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes:
 - a. For continuous surfaces, refinish to nearest intersection.
 - b. For an assembly, refinish entire unit.

E. Existing Utilities Services:

1. Interruptions to critical existing utility services will not be allowed.
2. All exposed conduits, wires, and/or cables shall be provided with sufficient protection and support to prevent failure, fraying, or damage due to construction operations.
3. The Contractor shall exercise measures as necessary to prevent the placement of impediments that limit continuous access by authorized utility company or DMH maintenance personnel and shall be required to reimburse the utility company or DMH for any expense incurred as a result of need to remove any such impediments to access.

1.19 SECURITY REQUIREMENTS

- A. The Contractor shall familiarize himself with DMH's security requirements and shall abide by and conform with such established regulations at all times. The Contractor shall submit a list of personnel who will be responsible for the rehabilitation work and the maintenance service. List shall be kept current by Contractor.
- B. Proper identification must be worn at all times.

1.20 SAFETY REQUIREMENTS

- A. The Contractor shall be responsible for all means and methods as they relate to safety and shall comply with all applicable local, state, and federal requirements that are safety related. All Contractor and subcontractor employees shall be instructed daily to be mindful of the full time requirements to maintain a safe environment for the facility occupants including staff, visitors, clients, and the occurrence of the general public on or near the Site.

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- B. OSHA Safety and Health Course Documentation Records: Chapter 306 of the Massachusetts Acts of 2004 requires that everyone employed at the jobsite must complete a minimum 10-hour long course in construction safety and health approved by the U.S. Occupational Safety and Health Administration (OSHA) prior to working at the jobsite. Compliance is required for the Contractor's and subcontractors' on-site employees at all levels. This requirement does not apply to home-office employees visiting the Site or to suppliers' employees who are making deliveries.
- C. Documentation records shall be initially complied by the Contractor and subcontractors as part of certified payrolls, and the Contractor shall create and maintain a copy of the documentation on-site at all times.
- D. All accident reports are to be transmitted to the DMH Project Manager within 24 hours of occurrences.

1.21 SPECIAL REQUIREMENTS

- A. The Building is and will be occupied and has 24-hour seven days per week occupancy. The Contractor shall take precautions to prevent the spread of dust and debris, particularly where such materials may sift into the Building. The Contractor shall provide labor and materials to construct, maintain, and remove necessary temporary enclosures to prevent dust or debris in the construction area from entering the remainder of the Building.
- B. Work shall be conducted in a manner to afford maximum protection of building, facilities, employees and the public and to prevent unreasonable delay or interference with normal functioning of the building.

****** END OF SECTION ******

SECTION 013300
SUBMITTALS

PART 1 – GENERAL

1.1 PROVISIONS INCLUDED:

- A. Attention is directed to the CONTRACT and GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS which are hereby made a part of this Section of the specification.

1.2 SHOP DRAWINGS, DESIGN LETTER AND PRODUCT DATA

- A. The Contractor shall review and submit to the DMH Project Manager, shop drawings, product data, and design letter required by Specification Section.
- B. Shop Drawings: Original drawings shall be prepared by roofing system manufacturer and shall show layout, details of construction, and identification of materials including but not limited to:
 - 1. Include plans, elevations, sections, details, and attachments to other Work.
 - 2. Base flashings and membrane terminations.
 - 3. Tapered insulation, including slopes.
 - 4. Insulation fastening patterns.
- C. Design Letter: Roofing system manufacturer's Design Acceptance Letter identifying components, warranty and wind speed.
- D. Project Data for each type of material:
 - 1. Manufacturer's standard schematic drawings:
 - a. Modify drawings to delete information which is not applicable to project.
 - b. Supplement standard information to provide additional information applicable to project.
 - 2. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data:
 - a. Clearly mark each copy to identify pertinent materials, products or models.
 - b. Show dimensions and clearances required.
 - c. Show performance characteristics and capacities.

1.3 CONTRACTORS RESPONSIBILITIES

- A. The Contractor shall coordinate each submittal with requirements of work and contract documents.
- B. The Contractor's responsibility for errors and omissions in submittals is not relieved by DMH Project Manager's review of submittals.
- C. Notify DMH Project Manager in writing at time of submission, of deviations in submittals from requirements of contract documents or previous submissions.
- D. Work that requires submittals shall not commence unless submittals have DMH Project Manager's stamp and initials or signature indicating review and approval.
- E. After DMH Project Manager's review, the Contractor shall distribute required copies.

1.4 SUBMISSION REQUIREMENTS:

- A. Make submittals promptly and in such sequence as to cause no delay in the work.
- B. Submit four (4) opaque copies of shop drawings, and number of copies of product data which the Contractor requires for distribution, plus two (2) copies which will be retained by the DMH Project Manager.
- C. Submittals shall include:
 - 1. Transmittal letter
 - 2. Date and revision date.
 - 3. Project title.
 - 4. The names of:
 - a. Contractor
 - b. Subcontractor
 - c. Supplier
 - d. Manufacturer
 - 4. Identification of product or material.
 - 5. Relation to adjacent structure of materials.
 - 6. Field dimensions, clearly defined as such.
 - 7. Specification Section number.
 - 8. Applicable standards, such as ASTM number.
 - 9. A blank space 5 inches by 4 inch, for the DMH Project Manager's approval/rejection/approved as noted/revise and resubmit notation.

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10. Identification of deviations from contract document.
11. Contractors stamp, initialized or signed, certifying review and approval of submittals.

1.5 RESUBMISSION REQUIREMENTS

A. Shop Drawings:

1. Revise drawings as required and resubmit as specified for previous submittal.
2. Product Data: Submit new data as required from previous submittals.

1.6 DISTRIBUTION OF SUBMITTALS AFTER REVIEW

- A.** Distribute copies of shop drawings and project data which display the DMH Project Manager's written approval to appropriate Subcontractors.

1.7 SCHEDULE OF VALUES

- A.** Prior to the first request for payment, the Contractor shall submit to the DMH Project Manager, a draft Schedule of Values of the various portions of the work in sufficient detail to reflect various major components of each trade, including quantities when requested, aggregating the total contract sum, and divided so as to facilitate payments for work under each Section.
- B.** The draft Schedule of Values shall be prepared in such form as specified or as DMH may approve, and it shall include data to substantiate its accuracy.
- C.** Each item in the Schedule of Values shall include its proper share of overhead and profit. This Schedule including breakdown and values, requires the approval of DMH and shall be used only as a basis for the Contractor's request for payment.

****** END OF SECTION ******

**SECTION 015000
TEMPORARY FACILITIES AND CONTROLS**

PART 1 – GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT and GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION

- A. The Contractor shall be responsible for providing and maintaining temporary construction facilities and controls as specified herein.

1.3 HOISTING EQUIPMENT AND MACHINERY

- A. All hoisting equipment and machinery required for the proper and expeditious prosecution and progress of the work shall be furnished, installed, operated and maintained in safe condition by the Contractor for the use of all Subcontractor's material and/or equipment delivered to the designated hoisting area except that which is specifically required to be provided by the Subcontractors themselves and is so stated in each appropriately related Section of the Specifications. All costs for hoisting operating services shall be borne by the Contractor.

1.4 STAGING AND TEMPORARY LADDERS, RAMPS, RUNWAYS, ETC.

- A. All staging, exterior and interior, required to be over eight feet in height, shall be furnished and erected by the Contractor and maintained in safe condition by him without change to, and for the use of all trades as needed by them for proper execution of their work.

1.5 DUST CONTROL

- A. The Contractor shall provide adequate means for the purpose of preventing dust caused by construction operations throughout the period of the construction contract.
- B. This provision does not supersede any specific requirements for methods of construction or applicable general conditions set forth in the contract articles with added regard to performance obligations of the Contractor.

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- C. The Contractor shall provide and maintain floor mats at access points to prevent the tracking of dust.

1.6 NOISE CONTROL

- A. Develop and maintain a noise-abatement program and enforce strict discipline over all personnel to keep noise to a minimum.
- B. Execute construction work by methods and by use of equipment which will reduce excess noise.
 - 1. Equip air compressors with silencers and power equipment with mufflers.

1.7 CLEANING DURING CONSTRUCTION

- A. The Contractor shall perform clean-up operations during construction as herein specified.
- B. The Contractor shall at all times during the progress of the work, keep the work area and other adjacent areas from accumulation of waste materials or rubbish.
- C. Cleaning and removal of waste material and/or rubbish must be performed on a daily basis.
- D. Control accumulation and remove waste materials, debris and rubbish from the Site periodically and dispose of at legal disposal areas off the construction site. The Contractor shall bear all costs, including fees resulting from such disposal.
- E. Store volatile wastes in covered metal containers, and remove from premises.
- F. Prevent accumulation of wastes which create hazardous conditions.
- G. Provide adequate ventilation during use of volatile or noxious substances.
- H. Conduct cleaning and disposal operation to comply with local ordinances and anti-pollution laws.
 - 1. Do not burn rubbish and waste materials on site.
 - 2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
- I. Use only those materials which will not create hazards to health or property and which will not damage surfaces.

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- J. Use only those cleaning materials and methods recommended by manufacturer of surface materials to be cleaned.
- K. Provide on-site containers for collection of waste materials, debris and rubbish.
- L. All vehicles carrying loose, dry material such as roofing materials or refuse, construction debris, etc., shall be covered by tarpaulins to prevent blowing away or spillage of contents. All spillage of whatever nature shall be promptly taken up and removed.

****** END OF SECTION ******

SECTION 016000
PRODUCT REQUIREMENTS

PART 1 – GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT and GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 PRODUCTS

- A. Products include material, equipment and systems. Products shall be new, best of their respective kinds and free from defects.
- B. Comply with Specifications and referenced standards as a minimum requirement.
- C. Components required to be supplied in quantity within a Specification Section shall be the same, and shall be interchangeable.
- D. Do not use materials and equipment removed from existing structures, except as specifically required, or allowed, by the Contract Documents.
- E. Materials and equipment of similar application: same manufacturer, except as noted.
- F. Secure approval of materials, equipment and installation

1.3 WORKMANSHIP

- A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.
- B. Perform work by persons qualified to produce workmanship of specified quality.
- C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration and racking.

1.4 MANUFACTURER'S INSTRUCTIONS

- A. When work is specified to comply with manufacturer's instructions, submit copies as specified in Section 013300 - SUBMITTALS.
- B. Perform work in accordance with details of instructions and specified requirements.
- C. There shall be no deviations from this Specification or the approved shop drawings without the prior written approval of the manufacturer. Any deviation from the manufacturer's installation must be supported by a written certification on the manufacturer's letterhead and presented to for the DMH Project Manager consideration.

1.5 TRANSPORTATION AND HANDLING

- A. Refer to CONTRACT and GENERAL CONDITIONS and Specification Sections for requirements pertaining to transportation and handling of materials and equipment.
- B. Transport products by methods to avoid product damage.
- C. Deliver roofing materials to Site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.
- D. Provide equipment and personnel to handle products by methods to prevent soiling or damage.
- E. Promptly inspect shipments to assure that products comply with requirements, that quantities are correct and products are undamaged.

1.6 STORAGE AND PROTECTION

- A. Refer to CONTRACT and GENERAL CONDITIONS and Specification Sections for requirements pertaining to storage and protection of materials and equipment.
- B. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weathertight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions.

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- C. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.
- E. Arrange storage to provide access for inspection. Periodically inspect to assure that products are undamaged, and are maintained under required conditions.
- F. Unload, store, and install sheet metal flashing materials and fabrications in a manner to prevent bending, warping, twisting, and surface damage.
- G. Stack materials on platforms or pallets, covered with suitable weathertight and ventilated covering. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.
- H. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
- I. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- J. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- K. When placing roofing materials for storage on the roof, handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

******* END OF SECTION *******

SECTION 017000
CLOSEOUT PROCEDURES

PART 1 – GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT and GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 FINAL CLEANING

- A. Upon completion of the work under this Contract, the Contractor shall leave the project site ready for use without the need for further cleaning or directly related painting of any kind and with all work in perfect order. The Contractor shall perform final cleaning operations as herein specified prior to final inspection.
- B. At the completion of work, all rubbish, debris, waste, materials, and salvaged materials shall be removed from the site. All tools, scaffolds, apparatus and appliances used in connection with work shall be removed by the Contractor, and the premises shall be left in clean condition.
- C. Cleaning shall include all surfaces, interior and exterior in which the Contractor has had access whether existing or new.
- D. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.
- E. Use only those cleaning materials and methods that are recommended by the manufacturer of surface material to be cleaned.
- F. Employ experienced workmen or professional cleaners for final cleaning operations.
- G. Remove grease, mastic, adhesives, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed interior and exterior surfaces.
- H. Repair, patch and touch up marred surfaces to specified finish, to match adjacent surfaces.
- I. The Contractor shall remove from the site , all building rubbish, unused materials belonging to him or used under his direction during construction

or impairing the use or appearance of the property and shall restore such areas affected by the work to their original condition

- J. Prior to final completion, the Contractor shall conduct an inspection of sight-exposed interior and exterior surfaces, and all work areas, to verify that the entire work is clean.

1.3 PROJECT DOCUMENTS

- A. Record Drawings shall consist of **all** the contract drawings. Drawings shall be provided in electronic form and on CD.
- B. Project Manuals:
 - 1. Before requesting acceptance of work, furnish as required, copies of product manuals shall be provided to the DMH Project Manager. The Project Manual shall contain, but not be limited to:
 - a. Final detail of all submittals: EPDM, insulation, frame, trim etc.
 - b. Product reference including Manufacturer's name and material description detail sheet for all major applicable materials and finishes.
 - c. Copies of manufacturer's final inspection reports to DMH prior to the issuance of the manufacturer's warranty.
 - d. Product data on all related work.
 - 2. Complete project manual and all detail and documentation to also be electronic and furnished on CD.
- C. Operation and Maintenance Manuals: Should include cleaning, replacement parts information, warranties, all contact information of subcontractors and a formal warranty for all work completed.
- D. Preventative Maintenance Checklist: Per recommendations of manufacturer's.

1.4 GUARANTEES AND WARRANTIES

- A. The Contractor shall submit to the DMH Project Manager all extended guarantees and warranties that have been specified in various, individual Sections of the Specifications.
- B. Contractor's Warranty: The roofing subcontractor shall supply DMH with a minimum two-year workmanship warranty, starting at the date of final acceptance of the Project. In the event any work related to the roofing,

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flashing, or metalwork is found to be defective within two years of final acceptance, the Contractor shall remove and replace such at no additional cost to the Commonwealth. The Contractor's warranty obligation shall run directly to DMH, and a copy the roofing signed warranty shall be sent to the roofing system's manufacturer.

1. The duration of the Contractor's two-year warranty shall run concurrent with the roofing system's manufacturer's 20-year warranty.
- C. **Roofing Systems Manufacturer's Warranty:** The roofing manufacturer shall guarantee roof areas to be in a watertight condition, for a period of 20 years, starting at the date of Final Acceptance of the Project. The warranty shall be a 20-year no dollar limit (NDL), non-prorated total system labor and material warranty, for wind speeds up to 72 miles per hour. Total system warranty shall include all roofing materials, related components and accessories including, but not limited to the substrate board, vapor retarder, insulation board, cover board, roofing membrane, membrane flashings, fasteners, adhesives, metal roof copings, metal roof edges and termination metals and roof drain assemblies. The manufacturer shall repair defects in materials and workmanship as promptly after observation as weather and site conditions permit.
- D. Should Contractor fail to remedy such defects within the agreed length of time, to be specified in notice from DMH, DMH may have such work performed by another contractor and charge the entire cost to the Contractor.

****** END OF SECTION ******

**SECTION 024119
SELECTIVE DEMOLITION**

PART 1 – GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT and GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.
- B. Equality of material, article, assembly or system other than those named or described in this Section shall be determined in accordance with the provisions of the CONTRACT and GENERAL CONDITIONS.

1.2 DESCRIPTION

- A. It is not the intent herein to describe all the items and work required to be removed under this Section. The Contractor shall assure himself that all of the work to be removed, not otherwise specified herein or described under other Sections shall be removed under this Section at no additional cost to the Commonwealth.
- B. The Contractor shall also examine other Sections of these Specifications and familiarize himself with their provisions regarding the removal of existing items and work. He shall understand that all items and work not specifically mentioned to be removed by the requirements of other Sections of these Specifications shall be removed as part of the work under this Section.
- C. The scope of work consists of material and services to be furnished under this Section, and without limiting the generality thereof, includes labor, equipment and services required for the removal of existing work, special protection and all work incidental thereto as specified herein and as shown on the Drawings.

1.3 RELATED WORK

- A. The following work is not included in this Section and is to be performed under the contracted scope of work:
 - 1. Movable items and items of DMH's equipment in the areas of the existing building affected by the work under this Contract will be removed by DMH.

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2. The patching and/or repair of any existing materials, equipment, structure caused by work performed under this scope of work is to be included under these Specifications describing similar construction. The Contractor shall do his utmost to keep such necessary patching and repairing to a minimum.
3. Disconnecting of existing services, as required, will be done by the respective contractor as described within their scope of work specifications.

1.4 PERMITS AND CODES

- A. Work specified herein shall conform to Specifications and shall comply with all rules, regulations, laws and ordinances of the Commonwealth of Massachusetts.
- B. The Contractor shall procure and pay for all permits and licenses required for the complete work specified or inferred under this Section.

1.5 SCHEDULING

- A. Before beginning the removal and demolition, the Contractor shall consult jointly with the DMH Site Director and DMH Project Manager to determine the schedule of work, exact places, times and days during which the removal and demolition work may, or may not be carried on, and to determine further reasonable requirements, particularly in regards to noise prevention, dust prevention, weather protection, and safety precautions.
- B. No work shall be started in existing building without prior approval of the DMH Facility Manager. The Contractor shall give the DMH Site Director adequate advance notice of his/her readiness to start such work in order that they may properly rearrange activities or evacuate the spaces to be affected.

1.6 EXAMINATION OF PREMISES

- A. The Contractor will be held to have examined the premises before submitting proposals for the work and to have satisfied himself as to the existing conditions under which he will be obliged to operate or that will in any way affect the work.
- B. The Contractor is responsible to determine the character and amount of materials and debris to be removed. No allowances will be made in this connection for error or negligence of the Contractor.

1.7 ENCLOSURES

- A. Provide temporary barriers and/or protection as required to separate work areas from DMH's occupied areas, to prevent penetration of dust and moisture into occupied areas, to prevent damage to existing areas and equipment. Construction shall be sheet materials with closed joints and sealed edges at intersections with existing surfaces to ensure no infiltration of the outdoor elements.
- B. Provide plastic sheet material and tape to seal HVAC supplies and exhaust to ensure no debris enters the existing system. Insure that dust does not enter the ductwork.

1.8 PROTECTION

- A. The removal of all designated roofing materials to be removed shall be done with utmost care, using tools and methods that will not transfer any heavy shocks to the remaining portions of the existing building. All possible care shall be taken to avoid vibration and other disturbances.
- B. When removing materials, etc., from the roof and surrounding area the Contractor shall take all precautions and use whatever protective devices, shoring, guardrails, and the like as may be required to assure that the remaining and adjacent portions of the existing work which is to remain is substantially protected and/or not loaded beyond safe limits.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

3.1 PREPARATION

- A. Before starting the removal of work, the Contractor shall arrange for the protection of active utility services in the areas where construction work is to take place. All work on surrounding existing equipment shall be accomplished by the respective subtrades or utility companies having jurisdiction.

3.2 REMOVAL OF EXISTING WORK

- A. Provide dust protection to contain dust and debris to the work area.
- B. Disconnect utilities as required.

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- C. Removal of the existing membrane roofing.
- D. Removal of rigid insulation.
- E. Removal of existing parapet coping and additional flashing at roof top equipment.

3.3 STORM DRAIN PROTECTION AND MAINTENANCE

- A. The Contractor shall take precautions to prevent roof drains from clogging during demolition activities. Remove debris at the completion of each day's work and clean drains, if required. At completion, test drains to ensure the system is free running and drains are watertight. Remove strainers and plug drains in areas where work is in progress. Install flags or other telltales on plugs. Remove plugs each night and screen drains.

****** END OF SECTION ******

SECTION 061000
ROUGH CARPENTRY

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.
- B. Equality of material, article, assembly or system other than those named or described in this Section shall be determined in accordance with the provisions of the CONTRACT and GENERAL CONDITIONS.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Wood blocking, cants, and nailers.

1.3 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used, net amount of preservative retained, and chemical treatment manufacturer's written instructions for handling, storing, installing, and finishing treated material.

PART 2 - PRODUCTS

2.1 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWPAC2 (lumber) and AWPAC9 (plywood), except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPAC31 with inorganic boron (SBX).

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1. Preservative Chemicals: Acceptable to authorities having jurisdiction and not containing arsenate.
- B. Kiln-dry material after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark each treated item with the treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.
- D. Application: Wood cants, nailers, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.

2.2 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
 1. Where carpentry is exposed to weather, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Nails, Wire, Brads, and Staples: FS FF-N-105.
- C. Power-Driven Fasteners: CABO NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Screws for Fastening to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A with ASTM A 563 hex nuts and, where indicated, flat washers.
- G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

PART 3 - EXECUTION

3.0 INSTALLATION, GENERAL

- A. Discard units of material with defects that impair quality of carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.
- B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, cants nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- C. Apply field treatment complying with AWPAC M4 to cut surfaces of preservative-treated lumber and plywood.
- D. Securely attach carpentry work as indicated and according to applicable codes and recognized standards.
- E. Countersink fastener heads on carpentry work.
- F. Use fasteners of appropriate type and length. Pre-drill members when necessary to avoid splitting wood.

3.1 WOOD BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

******END OF SECTION******

**SECTION 075323
EPDM ROOFING**

PART ONE-GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.
- B. Equality of material, article, assembly or system other than those named or described in this Section shall be determined in accordance with the provisions of the CONTRACT and GENERAL CONDITIONS.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Adhered black membrane-roofing system.
 - 2. Cover board.
 - 3. Roof insulation.
 - 4. Vapor retarder.
 - 5. Flashing for equipment mounted on roof and roofing penetrations.
 - 6. Metal flashing for coping and wall
- B. Related Work: The following items are not included in this Section and will be performed under the designated Sections:
 - 1. Section 061000 – ROUGH CARPENTRY for wood nailers, curbs, and blocking

1.3 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.

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- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
- C. Roofing System Design: Roofing system shall be designed to withstand Code required loads and wind speeds.
- D. Flashings: Provide base flashings, perimeter flashings, detail flashings and component materials that comply with requirements and recommendations in FMG 1-49 Loss Prevention Data Sheet for Perimeter Flashings; FMG 1-29 Loss Prevention Data Sheet for Above Deck Roof Components; NRCA Roofing and Waterproofing Manual (Fourth Edition) for Construction Details and SMACNA Architectural Sheet Metal Manual (Fifth Edition) for Construction Details, as applicable.
- E. Energy Performance: Provide roofing system with Solar Reflectance Index (SRI) not less than 78 when calculated according to ASTM E 1980 based on testing identical products by a qualified testing agency.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain components for roofing system from an approved by roofing system manufacturer.
- B. Roofing Inspection: DMH will conduct inspections during installation of any deck replacement, insulation assembly, membrane, flashing and other appurtenances, and when a survey of the roof and roof drains is conducted. Cooperate with DMH's roofing inspection and allow unlimited access to roofing during construction.
- C. Roofing Signage: At entry points to roof, provide signage-listing type of roofing system, manufacturer, date installed, and holder of the warranty.

1.6 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

PART 2 PRODUCTS

2.0 GENERAL

- A. The manufacturer of the roof membrane shall also all polymeric components for the roofing system, including, but not limited to membrane, adhesives, primers, flashings, caulking, and tapes. All components shall be covered by warranty.

2.2 EPDM ROOFING MEMBRANE

- A. EPDM Roofing Membrane: 60-mil thick Ethylene Propylene Diene Terpolymer (EPDM) that conforms to the minimum properties of ASTM D 4637. The material shall be Type I, nonreinforced uniform, with minimum 10 foot wide flexible sheet and shall have a black exposed face color. The membrane shall be manufactured in a single panel with no factory splices to reduce splice intersections.
- B. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Carlisle Coatings & Waterproofing Inc.
 - b. Firestone Building Products Company.
 - c. GenFlex Roofing Systems
 - d. Mule-Hide Products Co. Inc.
 - e. Verisco
 - f. Johns Manville International, Inc.

2.2 AUXILIARY MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
 - 1. Liquid-type auxiliary materials shall meet VOC limits of authorities having jurisdiction.
- B. Sheet Flashing: 60-mil-thick EPDM, partially cured or cured, according to application.
- C. Bonding Adhesive: Manufacturer's standard bonding adhesive.
- D. Seaming Material: Manufacturer's standard synthetic-rubber polymer primer and 3-inch-wide minimum with cover strip or 6-inch-wide, butyl splice tape with release film.

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- E. Lap Sealant: Manufacturer's standard single-component sealant, color to match roofing membrane.
- F. Water Cutoff Mastic: Manufacturer's standard butyl mastic sealant.
- G. Metal Termination Bars: Manufacturer's standard predrilled stainless steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.
- H. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer.
- I. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, in-seam sealants, termination reglets, cover strips, and other accessories.
- J. Metal Edging and Membrane Terminations: Provide metal edgings that have been tested and meet ANSI/SPRI ES-1 standards and comply with the International Building Code. All metal work to be supplied and warranted by the manufacturer.

2.3 VAPOR RETARDER

- A. Vapor Retarder: Minimum 10 mil polyethylene sheet with maximum permeance rating of 0.10 perm.
 - 1. Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

2.4 ROOF INSULATION

- A. General: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated. .
- B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Grade 2 (20 psi) felt or glass-fiber mat facer on both major surfaces. Minimum R-value required is R30.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Atlas Roofing Corporation.

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- b. Carlisle SynTec Incorporated.
 - c. Firestone Building Products Company.
 - d. GAF Materials Corp.
 - e. Johns Manville International Inc.
- C. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches unless otherwise indicated.
- D. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.5 INSULATION ACCESSORIES

- A. General: Furnish roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.
- C. Cold Fluid-Applied Adhesive: Manufacturer's standard cold fluid-applied adhesive formulated to adhere roof insulation to substrate.
- D. Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/2 inch thick.

2.6 WALKWAYS

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, solid-rubber, slip-resisting, surface-textured walkway pads or rolls approximately 3/16 inch thick, and acceptable to membrane roofing system manufacturer.

PART 3- EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas and conditions for compliance with the following requirements and other conditions affecting performance of roofing system:
 - 1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.

2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
3. Verify that surface plane flatness and fastening of steel roof deck is still sound and reusable.
4. Proceed with installation only after any unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Comply with the manufacturer's published instructions for the installation of the membrane system including proper substrate preparation, jobsite considerations, and weather restrictions.
- B. The decking shall be clean, smooth, dry, and free of projections or contaminants that would prevent proper application of or be incompatible with new installation, such as fins, sharp edges, foreign materials, oil and grease. Ensure decking is prepared according to roofing system manufacturer's written instructions.
- C. The Contractor shall take precautions to prevent roof drains from clogging during roof installation activities. Remove debris at the completion of each day's work and clean drains, if required. At completion, test drains to ensure the system is free running and drains are watertight. Remove strainers and plug drains in areas where work is in progress. Install flags or other telltales on plugs. Remove plugs each night and screen drains.
- D. Prevent materials from spilling or migrating onto surfaces of other construction.
- E. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.3 VAPOR-RETARDER INSTALLATION

- A. Polyethylene Film Vapor Retarder: Loosely lay polyethylene-film vapor retarder over area to receive vapor retarder, side, and end lapping each sheet a minimum of 2 inches and 6 inches, respectively. Continuously seal side and end laps with tape.
- B. Completely seal vapor retarder at side laps, end laps, terminations, obstructions, and penetrations to prevent air movement into roofing system.

3.4 INSULATION AND COVERBOARD INSTALLATION

- A. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system manufacturer's written instructions for installing roof insulation.
- C. Install tapered insulation under area of roofing to conform to slopes indicated.
- D. Install one or more layers of insulation under area of roofing to achieve required thickness. Install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.
- E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- F. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.
 - 1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
- G. Mechanically Fastened Insulation and Coverboard: Install each layer of insulation and coverboard and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
 - 1. Fasten insulation according to requirements in FMG's "Approval Guide" for specified Windstorm Resistance Classification.
 - 2. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.

3.5 ADHERED ROOFING MEMBRANE INSTALLATION

- A. Install roofing membrane over area to receive roofing according to membrane roofing system manufacturer's written instructions. Unroll roofing membrane and allow to relax before installing.
- B. Start installation of roofing membrane in presence of membrane roofing system manufacturer's technical personnel.
- C. Accurately align roofing membrane and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

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- D. Bonding Adhesive: Apply bonding adhesive to substrate and underside of roofing membrane at rate required by manufacturer and allow to partially dry before installing roofing membrane. Do not apply bonding adhesive to splice area of roofing membrane.
- E. Adhesively fasten roofing membrane securely at terminations, penetrations, and perimeter of roofing.
- F. Apply roofing membrane with side laps shingled with slope of roof deck where possible.
- G. Tape Seam Installation: Clean and prime both faces of splice areas, apply splice tape, and firmly roll side and end laps of overlapping roofing membranes according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of roofing membrane terminations as required by roofing manufacturer.
- H. Repair tears, voids, and lapped seams in roofing that does not meet requirements.
- I. Spread sealant or mastic bed over deck drain flange at deck drains and securely seal roofing membrane in place with clamping ring.

3.6 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean splice areas, apply splicing cement, and firmly roll side and end laps of overlapping sheets to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of sheet flashing terminations.
- E. Terminate and seal top of sheet flashings.

3.7 WALKWAY INSTALLATION

- A. Flexible Walkways: Install walkway products in locations indicated. Adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.8 FIELD QUALITY CONTROL

- A. Cooperate with field quality control personnel. Allow DMH Project Manager access to work areas, as needed to perform inspections.
- B. Additional inspections and retesting of materials which fail to comply with specified material and installation requirements shall be performed at Contractor's expense.
- C. Final Roof Inspection: Engage roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to DMH Project Engineer.
 - 1. Notify the DMH Project Manager 48 hours in advance of date and time of inspection.
- D. Repair or remove and replace components of membrane roofing system where test results or inspections indicate that they do not comply with specified requirements.

3.9 PROTECTING AND CLEANING

- A. Protect membrane-roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to the DMH Project Manager.
- B. Correct deficiencies in or remove membrane-roofing system that does not comply with requirements, repair substrates, and repair or reinstall membrane-roofing system to a condition free of damage and deterioration at time of final acceptance and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

*****END OF SECTION*****